

# Auto-regulation of PfSR1 in *Plasmodium* *falciparum*

Shany Assaraf

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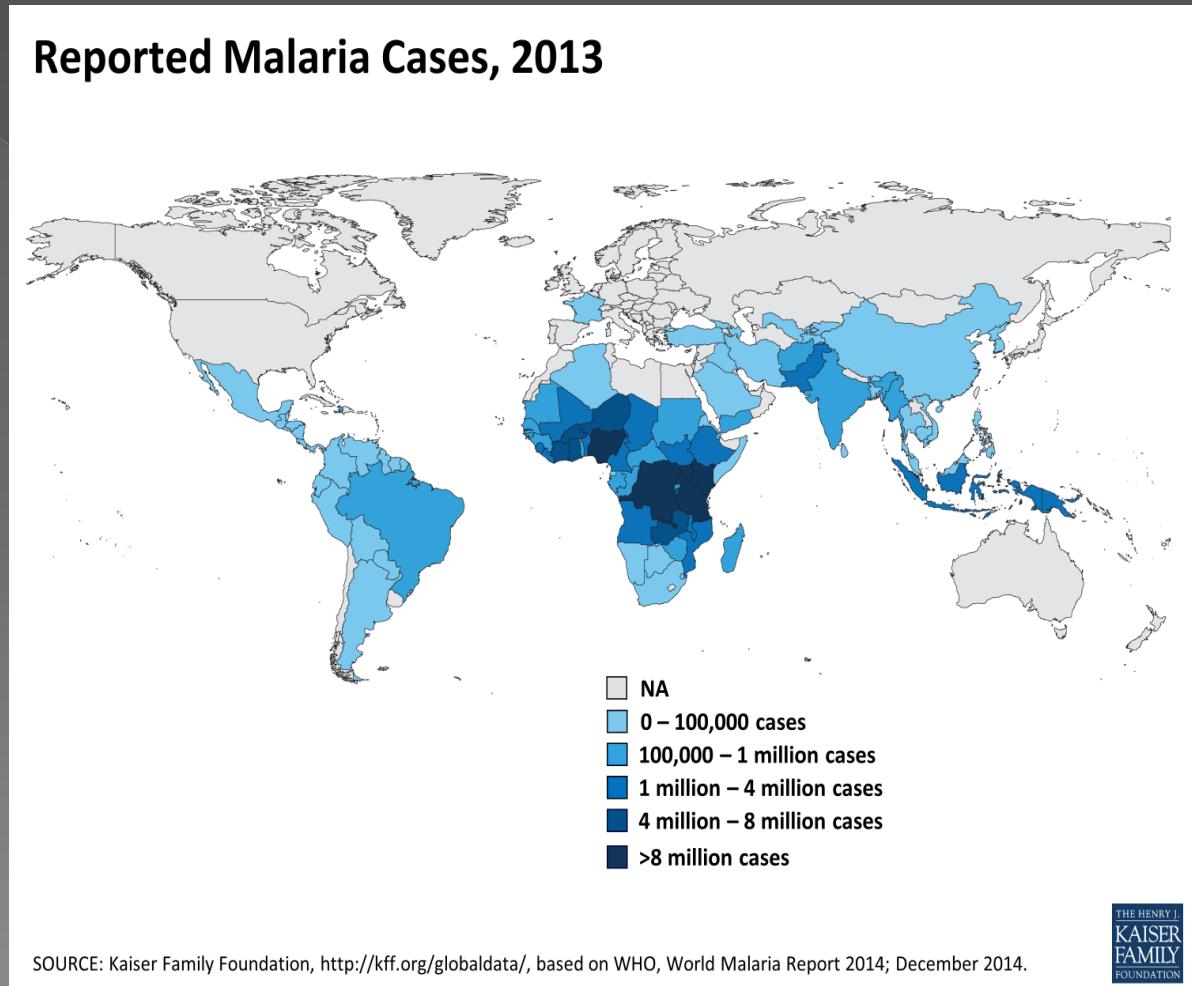
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# *Plasmodium falciparum*

- protozoan parasite responsible for deadliest form of human malaria
- Transmitted exclusively through the bites of *Anopheles* mosquitoes





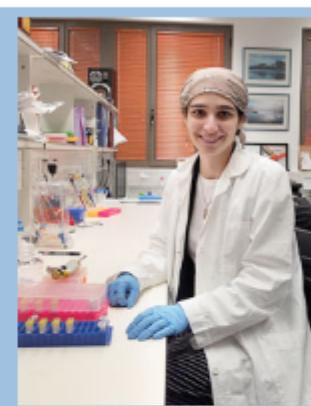
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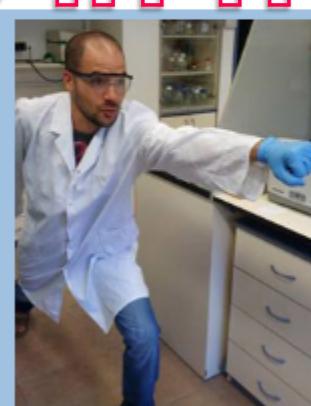
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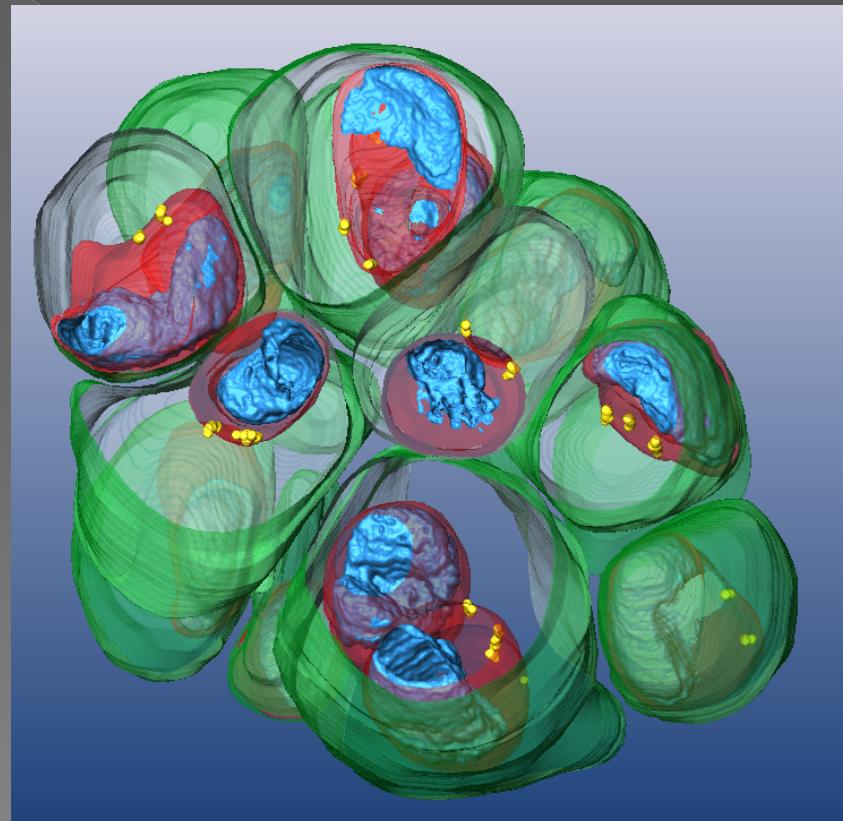
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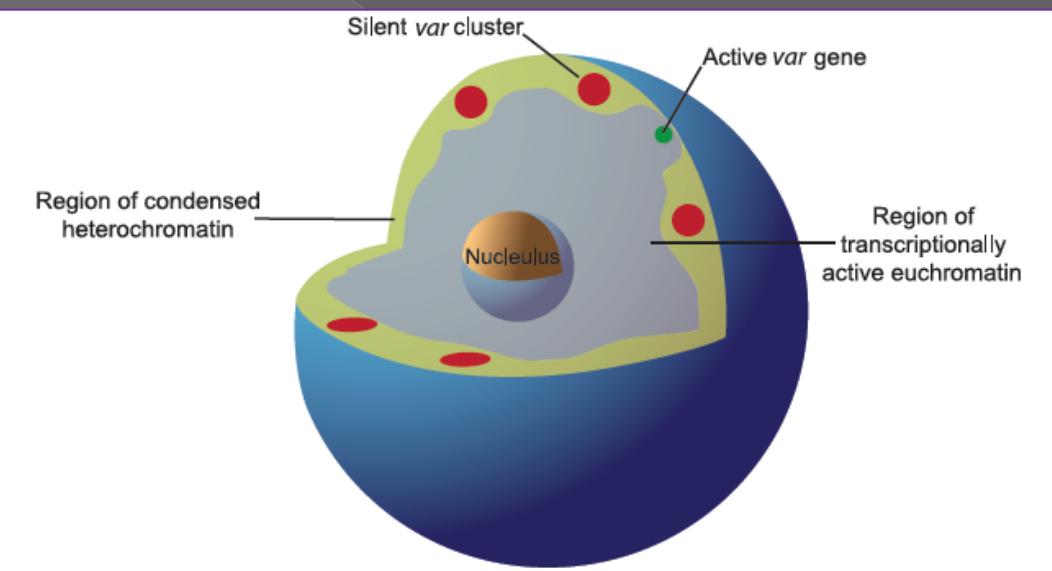
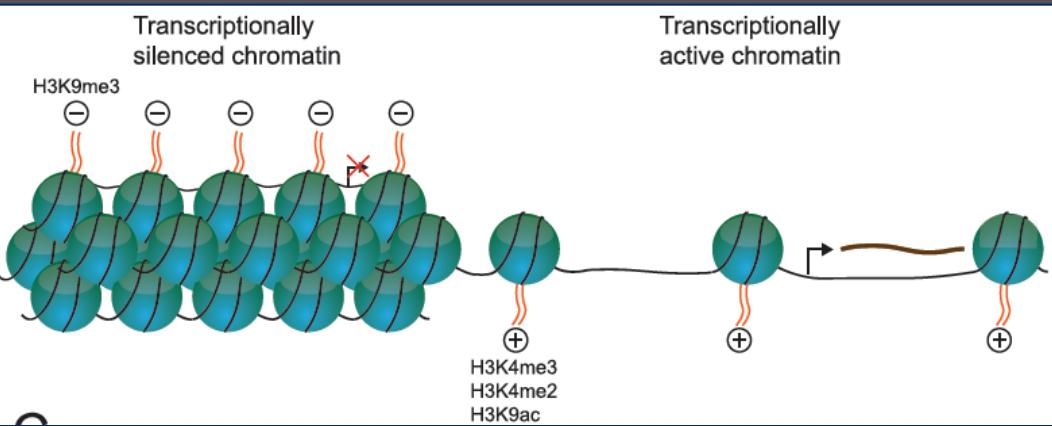
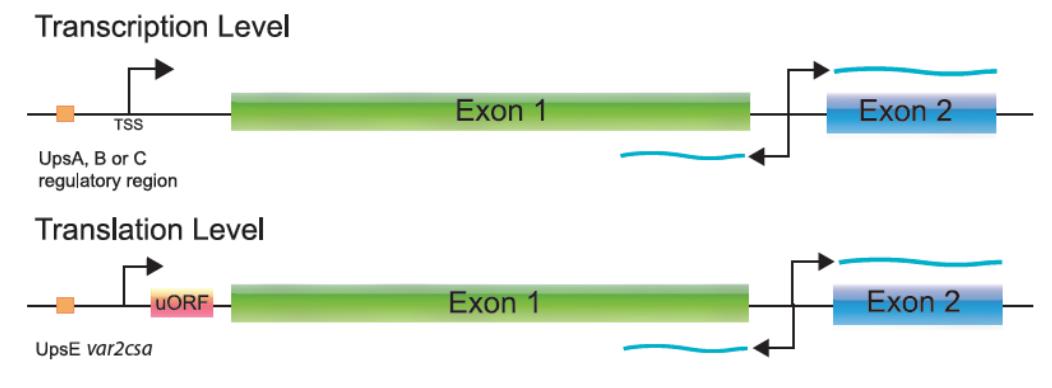
# M.A (and PHD)

# The main research questions in my lab

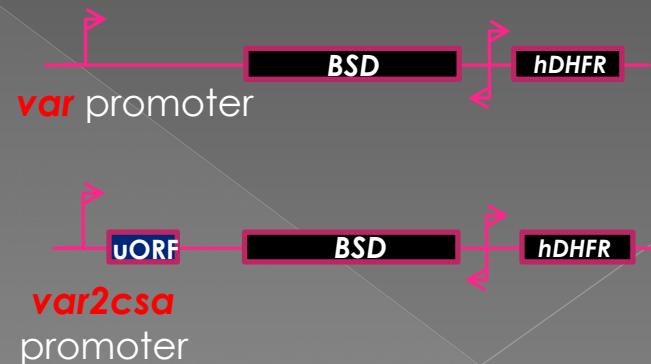
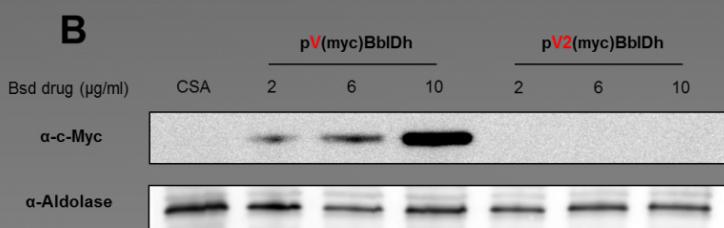
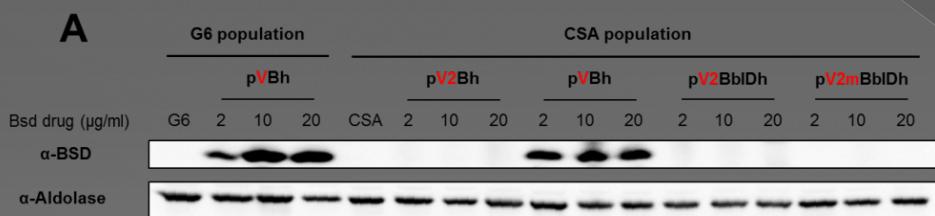
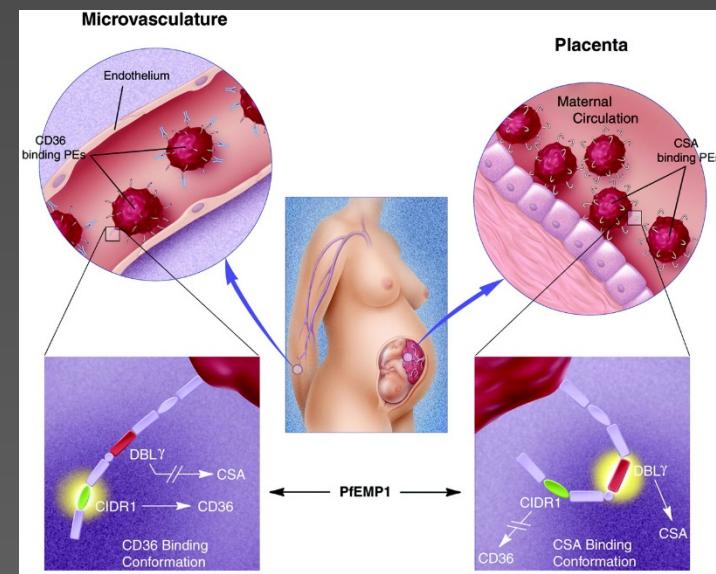
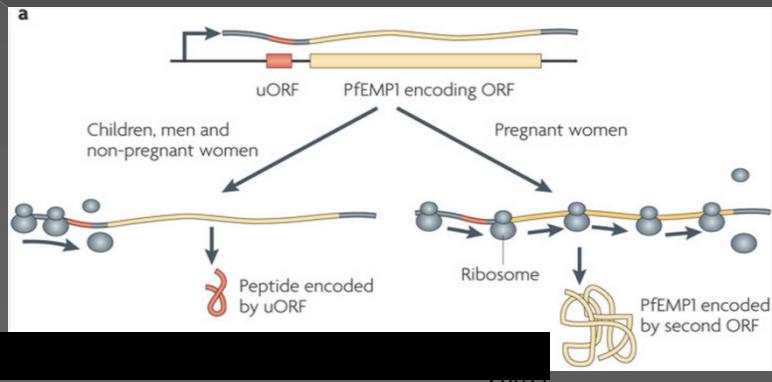
Gene regulation in *Plasmodium* parasites



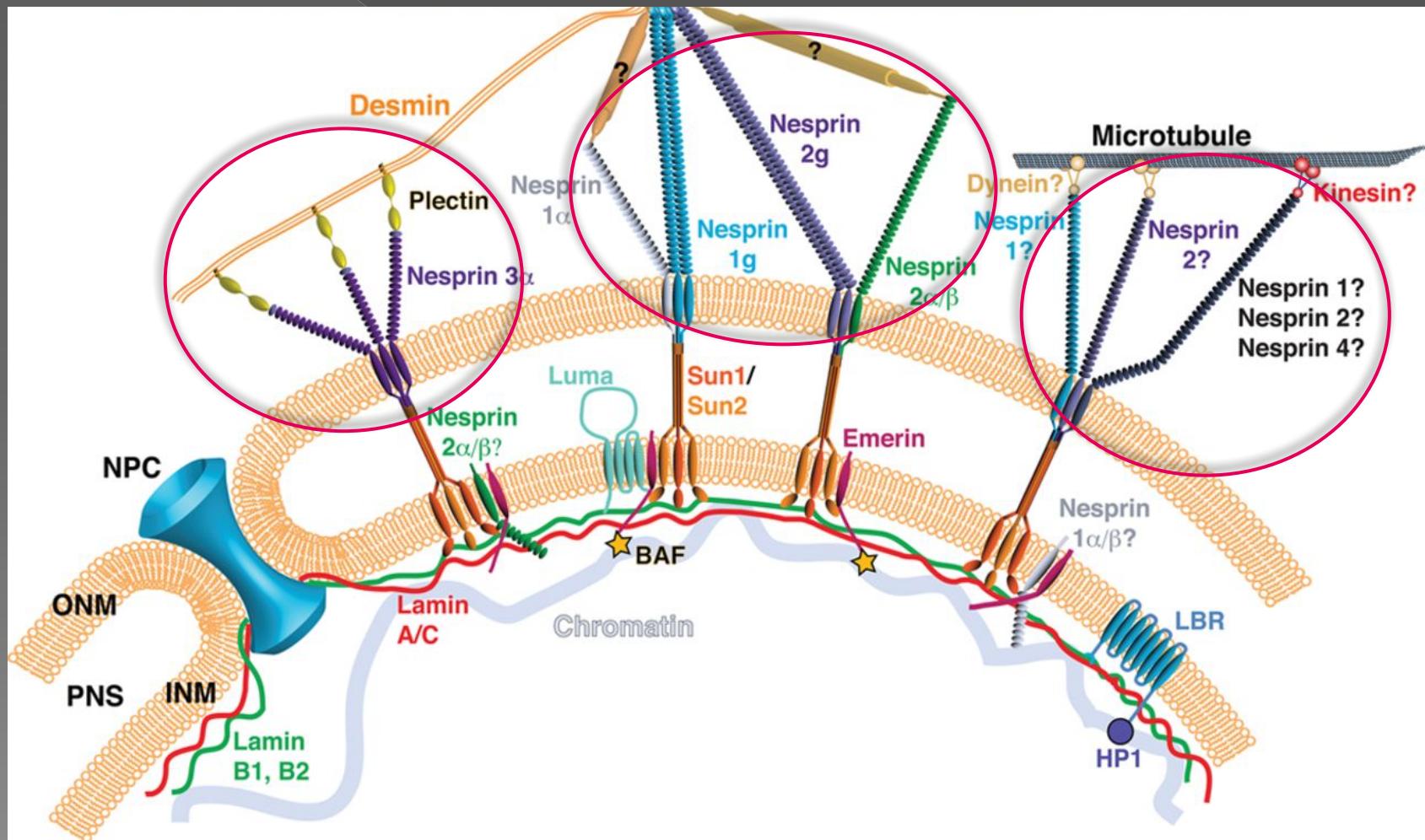
# Mechanisms involved in the regulation of *var* gene transcription: Repression and activation



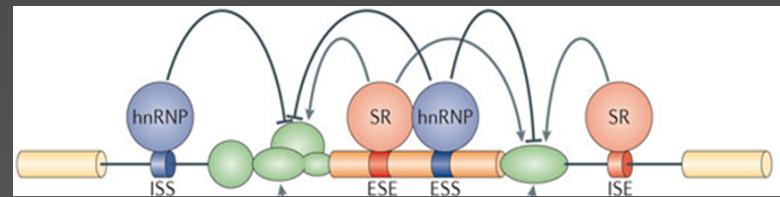
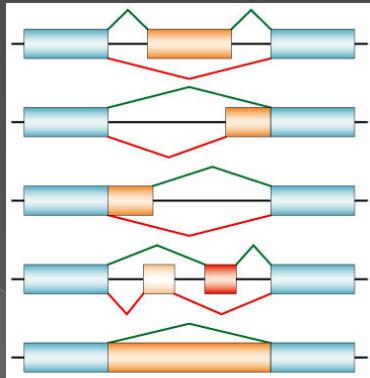
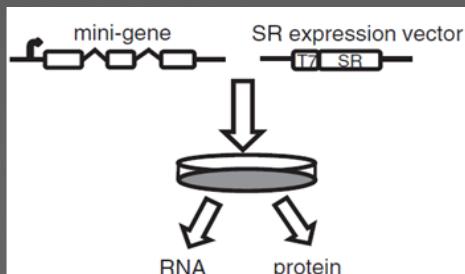
# Regulation of *var2csa*, the gene responsible for pregnancy associated malaria



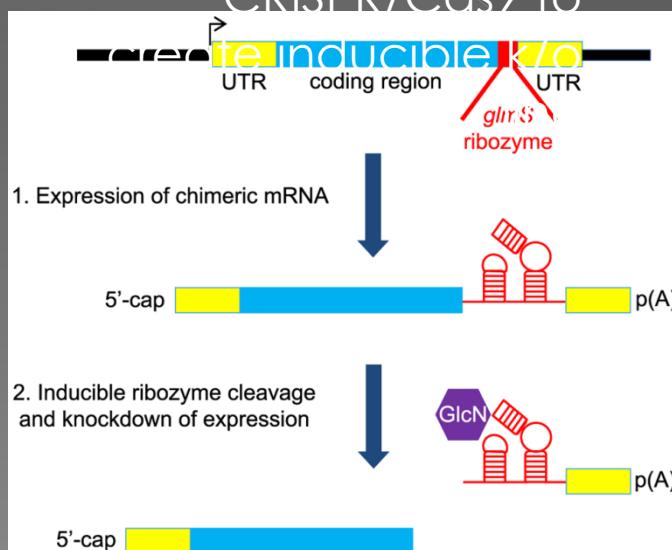
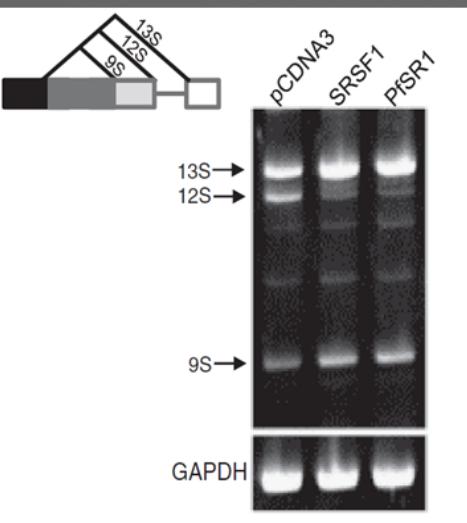
# Role of KASH-domain proteins in regulating nuclear dynamics



# The role of alternative splicing in Plasmodium biology

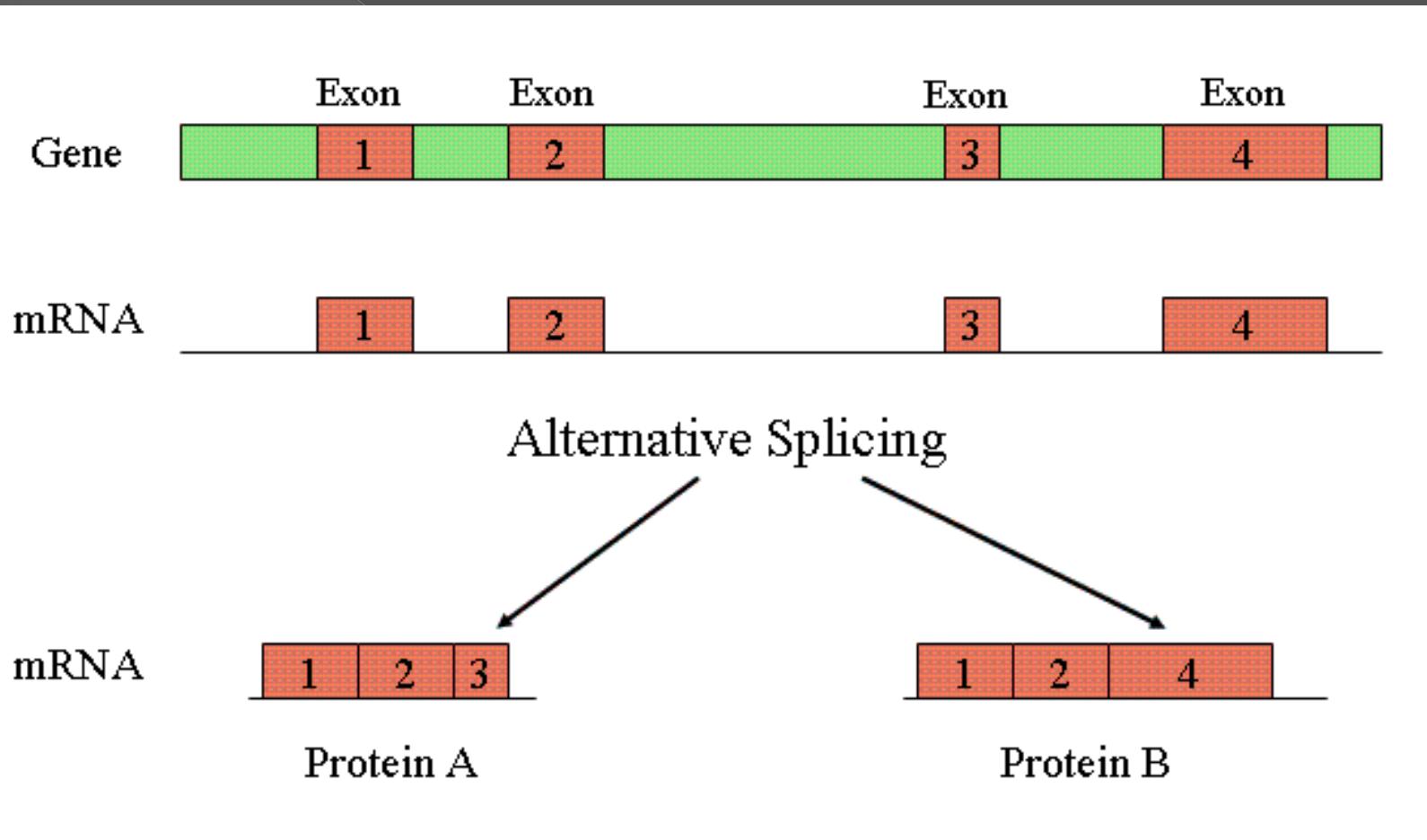


SR proteins are regulators of alternative splicing

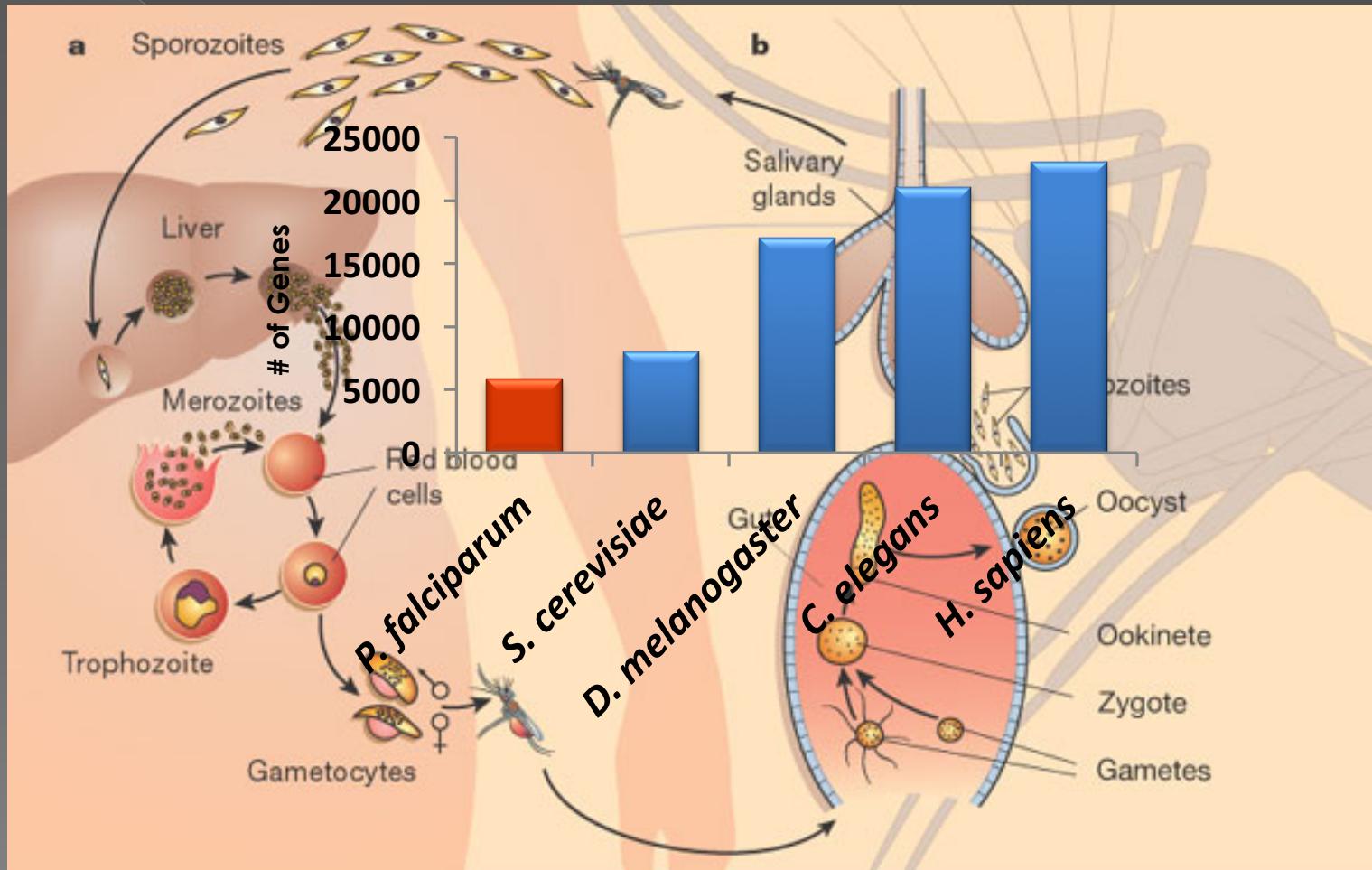


Use transgenic lines to:  
Proteomics – (1)  
interacting proteins  
RNA-seq – changes in (2)  
AS and transcription  
CLIP-seq – RNAs that (3)  
are bound by PfSR1

# Alternative splicing



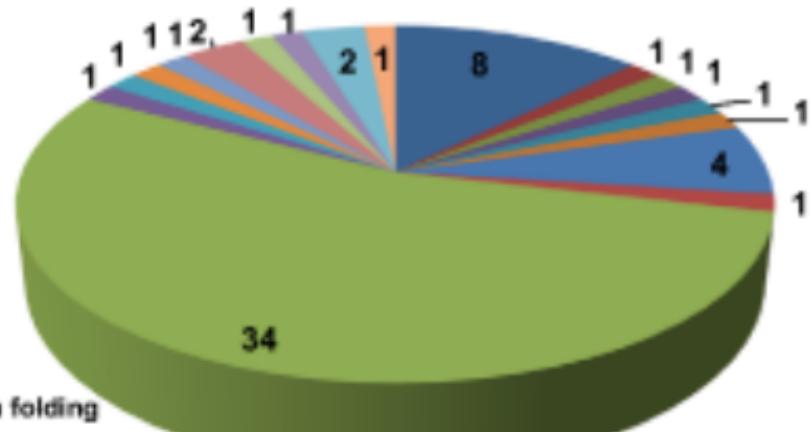
# Alternative splicing



# pfSR1

E.

- cell adhesion and pathogenicity
- cellular protein modification process
- deoxhypusine biosynthetic process
- proteolysis regulation of immune response
- intracellular protein transport, protein import into nucleus
- lipid biosynthetic process
- microtubule-based movement
- negative regulation of protein phosphatase type 2B activity, protein folding
- null
- attachment of GPI anchor to protein, translation, translational initiation
- phosphate ion transport
- protein phosphorylation
- quinone cofactor biosynthetic process
- regulation of transcription, DNA-dependent
- rRNA processing
- SRP-dependent cotranslational protein targeting to membrane, gamete generation
- ubiquitin-dependent protein catabolic process
- protein transport

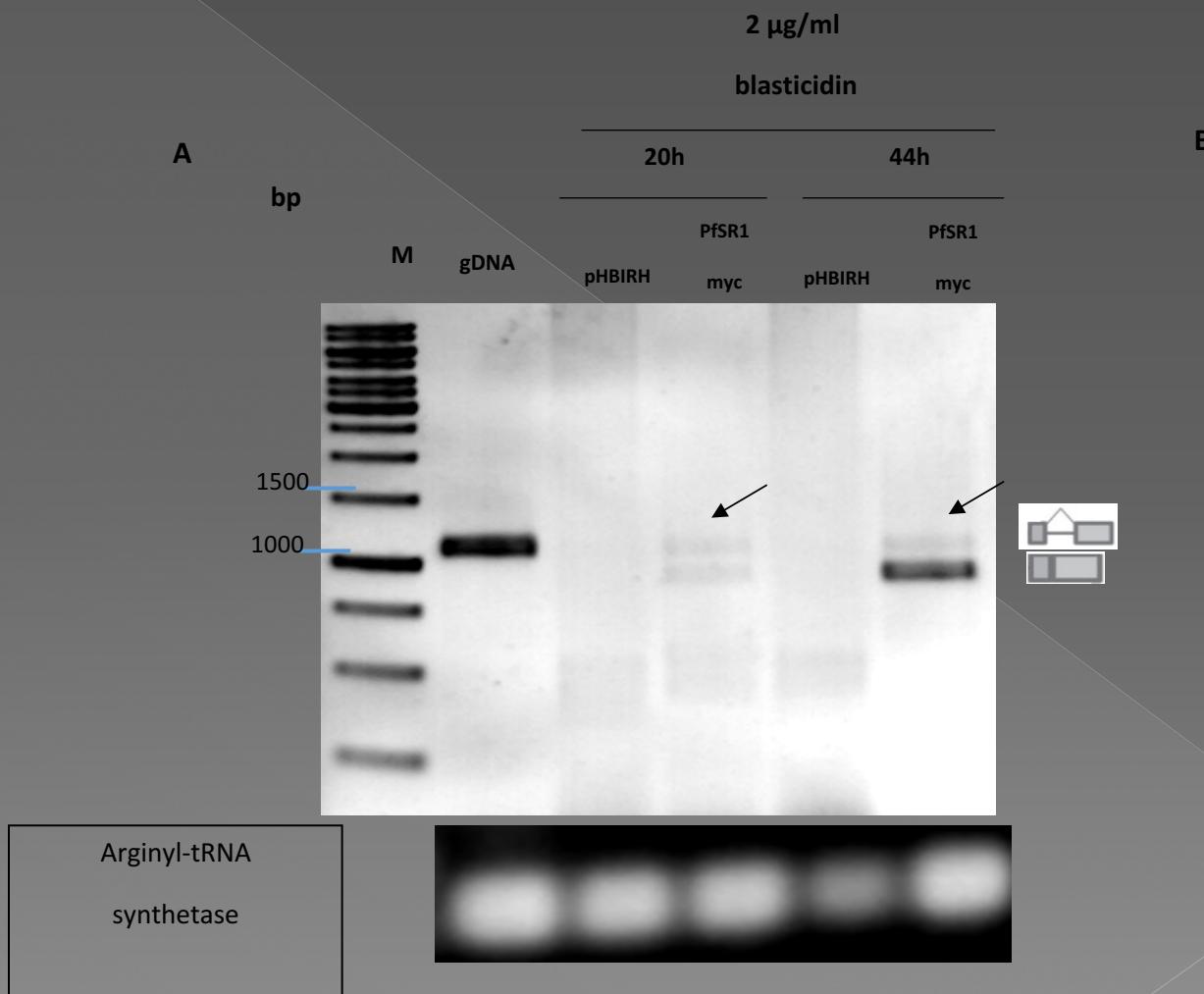


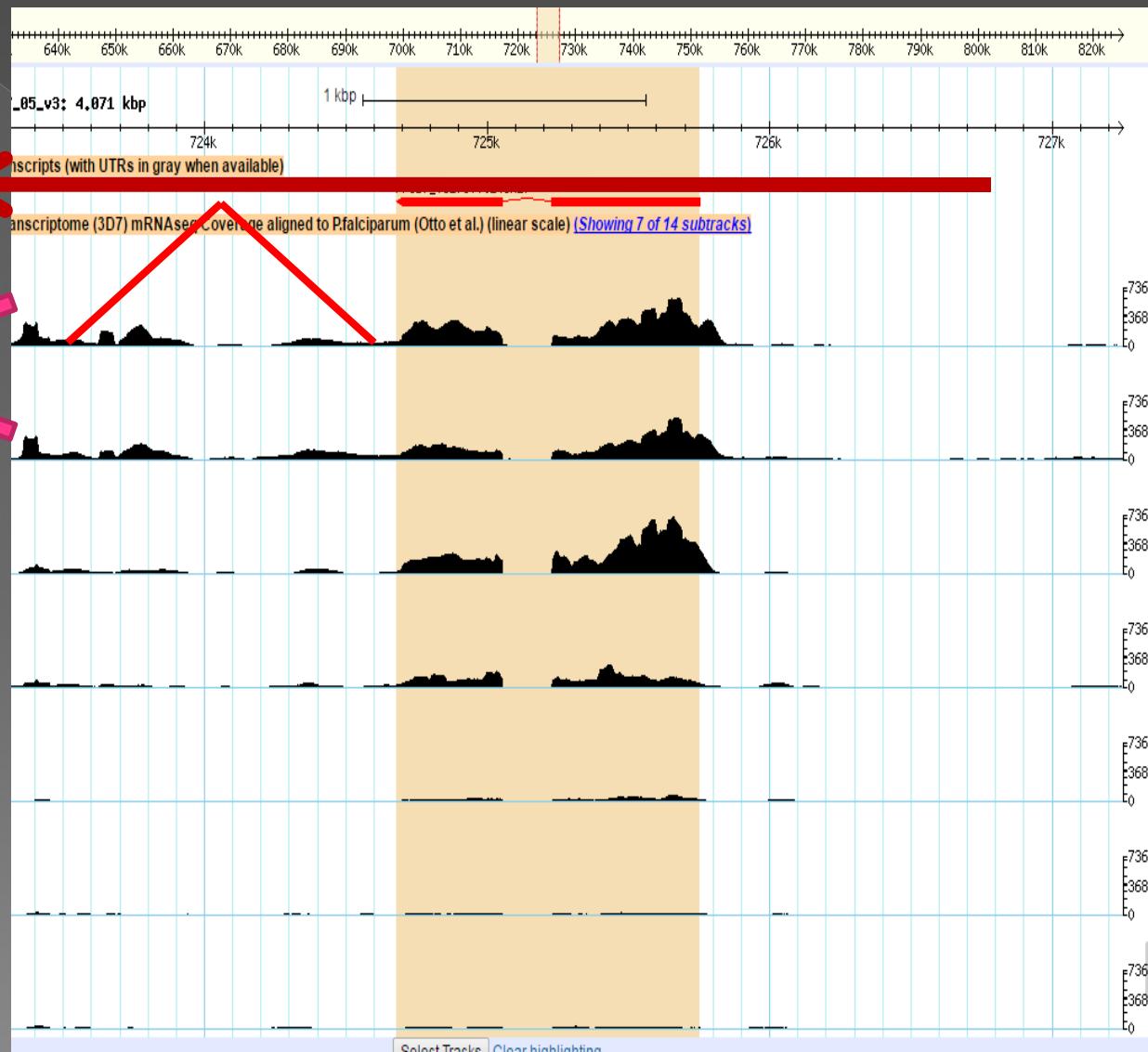
**AS in transport proteins' mRNAs**

**AS in lipid biosynthesis genes' mRNAs**

**Over-expression of pfsr1 influence AS activity in P. falciparum**

# Pfsr1 autoregulation

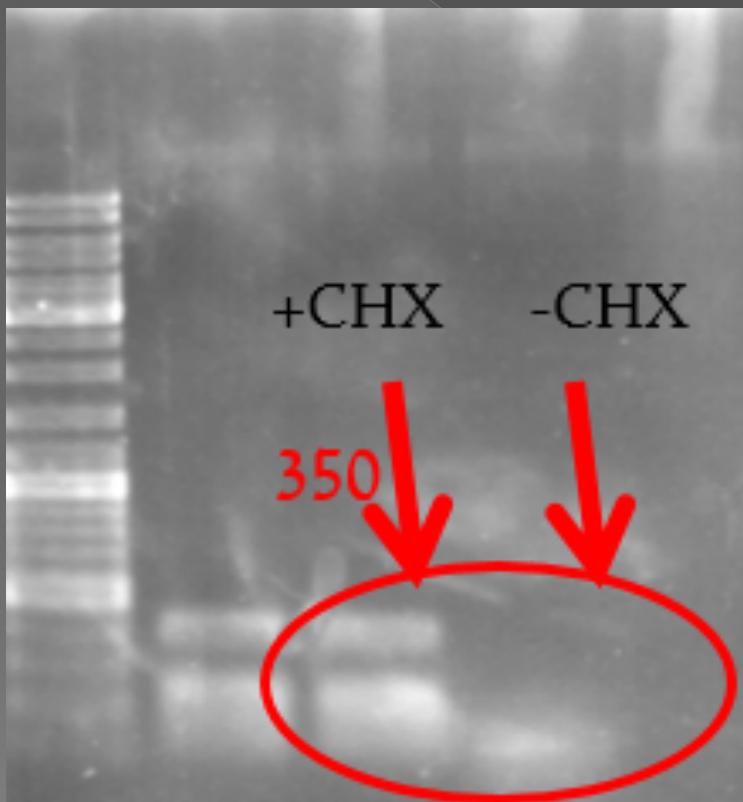




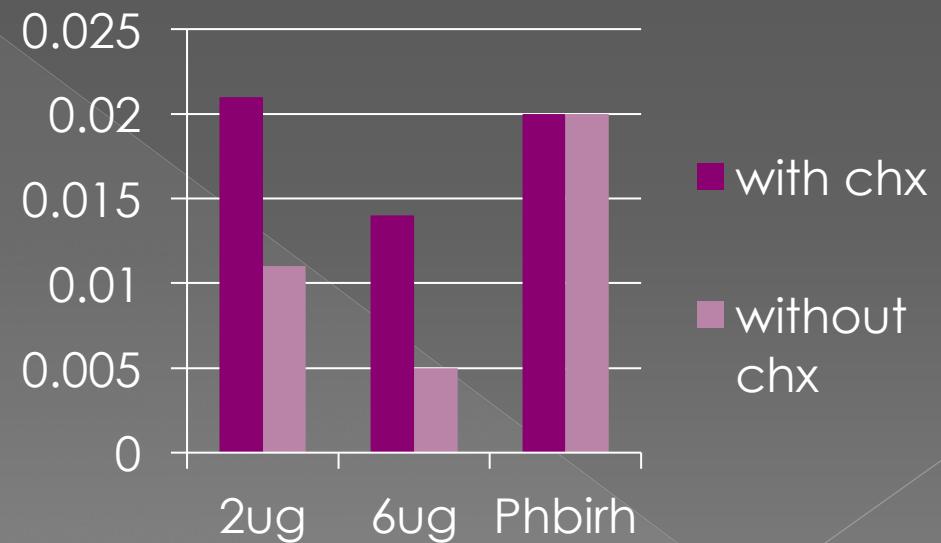
Early stages

RNA seq. by Otto et al.

# CHX experiment



Relative  
copy number



# My project right now

- CHX 
- WB- protein level 
- qRTpcr- for showing that  
increasing of exogenous pfsr1  
leads to a decrease in  
The endogenous pfsr1
- Upf1 knockdown->  
waiting for WR selection

# Difficulties and strengths

- In order to follow up changes in AS during KD, we need to analyze RNAseq of the full genome. In our lab there is a difficulty doing so.
- Improving my Bioinformatics skills, and analyzing data.
- Experienced in molecular biology methods.



**Thank you for  
your listening**